

# CLAIMS

What is claimed is:

1           1.       A method for producing an ultrasound image, comprising:  
2           generating ultrasound at a frequency of at least 20 megahertz (MHz);  
3           transmitting ultrasound at a frequency of at least 20 MHz into a subject;  
4           receiving ultrasound from the subject;  
5           processing the received ultrasound to provide an image having an effective  
6           frame rate of at least 200 frames per second (fps) using scan line based image  
7           reconstruction.

1           2.       The method of claim 1, further comprising generating ultrasound in a  
2           frequency range of about 20MHz to 60MHz.

1           3.       The method of claim 1, further comprising using the ultrasound on a  
2           small animal to image rapidly moving anatomy.

1           4.       The method of claim 3, wherein the small animal is a mouse.

1           5.       The method of claim 1, further comprising using the ultrasound on a  
2           small animal to image blood flow.

1           6.       The method of claim 5, wherein the small animal is a mouse.

1           7.       The method of claim 1, further comprising:  
2           generating a plurality of scan lines, each scan line generated at a specific  
3           location and offset in time from a reference point of an ECG rhythm.

1           8.     The method of claim 7, further comprising:  
2           assembling the plurality of scan lines based on the location and the point in  
3           time offset from the reference point.

1           9.     A system for developing an ultrasound image, comprising:  
2           a scan head having a transducer capable of generating ultrasound energy at a  
3           frequency of at least 20 megahertz (MHz); and  
4           a processor for receiving ultrasound energy and for generating an ultrasound  
5           image at an effective frame rate of at least 200 frames per second (fps) using scan  
6           line based image reconstruction.

1           10.    The system of claim 9, wherein the ultrasound occurs at a frequency  
2           range of about 20MHz to 60MHz.

1           11.    The system of claim 9, wherein the ultrasound is performed on a  
2           small animal to image rapidly moving anatomy.

1           12.    The system of claim 9, wherein the ultrasound is performed on a  
2           small animal to image blood flow.

1           13.    The system of claim 10, further comprising:  
2           a transmit subsystem configured to generate a plurality of scan lines, each  
3           scan line generated at a specific location and offset in time from a reference point of  
4           an ECG rhythm.

1           14.    The system of claim 10, further comprising:  
2           an image reconstruction subsystem configured to assemble the plurality of  
3           scan lines based on the location and the point in time offset from the reference point.

1           15.    A system for producing an ultrasound image, comprising:  
2                means for generating ultrasound at a frequency of at least 20 megahertz  
3                (MHz);  
4                means for transmitting ultrasound at a frequency of at least 20 MHz into a  
5                subject;  
6                means for receiving ultrasound from the subject; and  
7                means for processing the received ultrasound to provide an image having an  
8                effective frame rate of at least 200 frames per second (fps) using scan line based  
9                image reconstruction.

1           16.    The system of claim 15, further comprising means for generating  
2                ultrasound in a frequency range of about 20MHz to 60MHz.

1           17.    The system of claim 15, further comprising means for generating a  
2                plurality of scan lines, each scan line generated at a specific location and offset in  
3                time from a reference point of an ECG rhythm.

1           18.    The system of claim 17, further comprising means for assembling the  
2                plurality of scan lines based on the location and the point in time offset from the  
3                reference point.

1           19.     A method for producing an ultrasound image, comprising:  
2           generating ultrasound in a frequency range of 20-60 megahertz (MHz);  
3           transmitting the ultrasound into a small animal;  
4           receiving the ultrasound from the small animal;  
5           processing the received ultrasound to provide an image having an effective  
6           frame rate of at least 200 frames per second (fps) using scan line based image  
7           reconstruction to image rapidly moving anatomy, wherein the processing further  
8           comprises:  
9                 generating a plurality of scan lines, each scan line generated at a  
10           specific location and offset in time from a reference point of an ECG rhythm; and  
11                 assembling the plurality of scan lines based on the location and the  
12           point in time offset from the reference point.

1           20.     A method for producing an ultrasound image, comprising:  
2           generating ultrasound in a frequency range of 20-60 megahertz (MHz);  
3           transmitting the ultrasound into a small animal;  
4           receiving the ultrasound from the small animal;  
5           processing the received ultrasound to provide an image having an effective  
6           frame rate of at least 200 frames per second (fps) using scan line based image  
7           reconstruction to image blood flow, wherein the processing further comprises:  
8                 generating a plurality of scan lines, each scan line generated at a  
9           specific location and offset in time from a reference point of an ECG rhythm; and  
10                 assembling the plurality of scan lines based on the location and the  
11           point in time offset from the reference point.

1           21.     A system for developing an ultrasound image, comprising:  
2           a scan head having a transducer capable of generating ultrasound energy in a  
3 frequency range of 20-60 megahertz (MHz);  
4           a processor for receiving ultrasound energy and for generating an ultrasound  
5 image at an effective frame rate of at least 200 frames per second (fps) using scan  
6 line based image reconstruction;  
7           a transmit subsystem configured to generate a plurality of scan lines, each  
8 scan line generated at a specific location and offset in time from a reference point of  
9 an ECG rhythm; and  
10          an image reconstruction subsystem configured to assemble the plurality of  
11 scan lines based on the location and the point in time offset from the reference point.

1           22.     A system for producing an ultrasound image, comprising:  
2           means for generating ultrasound in a frequency range of 20-60 megahertz  
3 (MHz);  
4           means for transmitting the ultrasound into a subject;  
5           means for receiving ultrasound from the subject;  
6           means for processing the received ultrasound to provide an image having an  
7 effective frame rate of at least 200 frames per second (fps) using scan line based  
8 image reconstruction, wherein the means for processing comprises:  
9           means for generating a plurality of scan lines, each scan line  
10 generated at a specific location and offset in time from a reference point of an ECG  
11 rhythm; and  
12          means for assembling the plurality of scan lines based on the location  
13 and the point in time offset from the reference point.